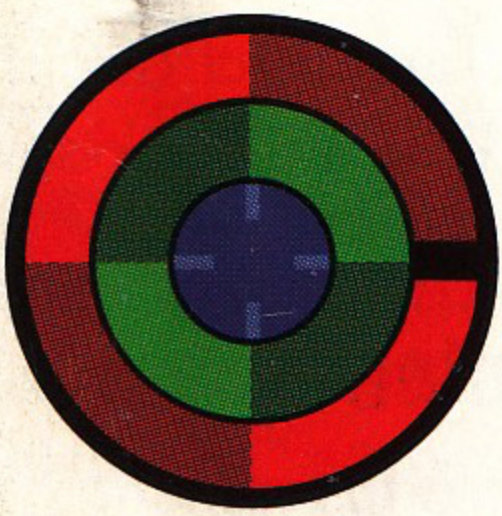
User Manual



CALIBAR

NewTek

Introduction

The NewTek CALIBARTM is a NTSC test signal generator designed for both studio and field operation. The 10-bit digital architecture and quality digital-to-analog converter ensure signal accuracy and long-term stability.

The rugged metal case, small size, battery or AC power and simple operation will make the CALIBAR an indispensable video tool for years to come. The CALIBAR will find a home in broadcast studios, video production facilities, and in the tool box of the video enthusiast.

Included in the 24 CALIBAR test patterns are signals that can be used to set-up, test and calibrate a variety of video devices. The CALIBAR can also be used as a black burst generator in both field and studio applications. Use a distribution amplifier (not included) to use the CALIBAR as a multi-output black burst generator.

Package Contents

- CALIBAR video instrument
- AC power adapter
- Three BNC adapters (BNC-to-BNC, BNC-to-RCA male, BNC-to-RCA female)
- CALIBAR glasses (used to calibrate video monitors)
- Operating instructions
- Warranty card

Powering the CALIBAR

The CALIBAR can be powered in the field by the use of readily available Photo/Electronic six-volt batteries. A battery-operated CALIBAR can provide more than two hours of continuous use. NewTek recommends the use of lithium-type batteries with CALIBAR; however, alkaline batteries will also provide functionality. The CALIBAR will automatically detect a low-battery voltage and shut down. Battery replacements can be found at electronics stores, photo shops, and larger department stores.

Typical battery replacements (others are available): Lithium - Radio Shack 23-266; Alkaline - Energizer A544 and Duracell PX28A.

Connecting the CALIBAR

The CALIBAR can easily be connected directly to any type of video equipment or video patch-bay. However, you may find it easier to connect the CALIBAR to a video cable that is connected to your video peripheral. The included BNC adapters will allow you to connect your CALIBAR to a variety of BNC and/or RCA type connectors.

Operating the CALIBAR

Operating the CALIBAR is simple. Make sure the CALIBAR is connected to the AC power adapter or that it has a battery installed. Next, connect the CALIBAR to your video monitor

or equipment so you can see the CALIBAR's output.

Double click and release the small button located on the CALIBAR video instrument. This will cause the LED located above the button to illuminate, indicating CALIBAR is operational and displaying one of its 24 test patterns.

To advance to the next pattern, simply press and release the button again. Each successive press will advance to the next pattern. If you advance past the pattern you want, simply continue until you come back around to your needed pattern.

To "power-down" your CALIBAR, hold down the button until the LED goes out! To conserve battery life, power-down your unit between tests. With the use of the AC power adapter, the CALIBAR may be left operating continuously.

Using the Video Test Patterns

1 SMPTE Bars A multi-purpose video test pattern which can be used to adjust reference video monitors and to check system components and total system performance.

Monitor Adjustment:

a Adjust the contrast (called picture on some Sony monitors) so that the white reference square at the lower left looks like a "good"

white and doesn't spread (blooming) into the darker squares on either side of it.

b Adjust monitor brightness by increasing the brightness to individually see the three small gray and black rectangles near the bottom right of the pattern below the red bar. This area is called the PLUGE. Now reduce the brightness until the line between the first and second PLUGE rectangles just disappears.

c Using a blue-only selector on the monitor or by viewing the provided CALIBAR glasses, the chroma (also called saturation or color) and phase (also called tint or hue) of the monitor may be adjusted by matching the gray shading of the first, third, fifth, and seventh bars to the rectangles below them in the mid-section of the SMPTE bars pattern (called the inverted blue bars). The chroma control mainly affects the matching at bars one and seven. The phase control mainly affects the matching at bars three and five.

d Turn the blue-only switch off, if used.

Video Decks, Non-linear Editing Systems and Video Processors:

Use SMPTE bars to verify system gain by feeding this pattern to the device and monitoring on a vectorscope and/or waveform monitor (WFM). The video line feeding the WFM must end in one and only one 75-ohm termination. The color bars appear on a WFM

as six vertical shaded rectangles called Chips. The white reference square of the pattern shows up on a WFM as a line at the top of the first two chips (yellow and cyan). Use the vertical position knob on the WFM to center the blanking level at 0 IRE. Adjust the video device's gain to place the line of white reference square at 100 IRE. When the low-pass filter is selected on a WFM, IRE levels should be gray 77, yellow 69, white 100, blue 56, green 48, magenta 36, red 28, blue 15.

Feeding a video device with SMPTE bars and then into a vectorscope and terminated monitor allows chroma phase to be checked. Select the 75-percent bars gain button on the vectorscope and rotate the vectorscope phase knob to line up the reference flag line to 0 degrees (nine o'clock). The points of the displayed pattern should land inside the squares for each color vector. Follow the manufacturer's instructions for the video device under test to line up the color vectors.

2 Multiburst FCC Used to measure gain vs. frequency response at important specific frequencies. They are 0.5 MHz, 1.0 MHz, 2.0 MHz, 3.0 MHz, 3.58 MHz (the video subcarrier) and 4.2 MHz (the highest frequency which can pass through a video broadcast transmitter).

3 Modulated Ramp Used to measure differential gain and phase. Refer to your

vectorscope manual for test procedures.

4 Blackburst 7.5 IRE Reference black level. With the AC power adapter use this for house sync.

5 White 100 IRE Used to set luminance level, and measure line rate non-linearity and noise in video processing equipment. Feed the device input with this signal and adjust the device's gain to make the pattern reach 100 IRE on a WFM over as much of the pattern as possible. Note the deviation in IRE of the pattern from 100 IRE.

6 Luma Ramp 0 to 100 IRE Used to check system low frequency linearity.

7 5 MHz Sweep With Markers Used to measure frequency response. Markers at 1 MHz, 2 MHz, 3 MHz, 4 MHz and 5 MHz provide reference points for checking level deviation in the video passband.

8 Crosshatch Used to adjust monitor convergence.

9 Red Used to view the color purity of red.

10 Luma 10 Step Shows luma at increments of 10 IRE. Used to test low frequency system linearity.

11 Luma 5 Step Shows luma at increments of 20 IRE. Used to check low frequency system linearity. View on a waveform monitor (WFM) and adjust variable gain on the device

or on the WFM to calibrate the top pattern step to 100 IRE with the blanking level at 0 IRE. Stairsteps should be within 1 IRE of each 20 IRE mark.

12 Bars With Multi-burst Combines functions of patterns 1 and 2.

13 EIA Bars Includes PLUGE Resembles SMPTE bars without the inverted blue bars mid-section.

14 Green Use to view the color purity of green.

15 Blue Use to view the color purity of blue.

16 Blackburst 0 IRE Reference black level.

17 Magenta Use to view the color purity of magenta.

18 Cyan Use to view color purity of cyan.

19 Bars/Red Used to see color purity and noise. Provides color bars with red across the bottom section.

20 Dots Used to adjust monitor convergence and focus.

21 Modulated 5 Step Displays chroma levels at increments of 20 IRE. Used to check differential phase and gain. Refer to your vectorscope and WFM manuals for test procedures.

22 Full Field Bars Used to check color levels and phase between two video sources.

By using a special effects generator (like the Video Toaster) to split the screen vertically, it allows bars from one source to appear above the bars from the other source.

23 Modulated 10 Step Displays chroma levels at increments of 10 IRE. Used to measure differential phase and gain. Refer to your vectorscope and WFM manuals for test procedures.

24 NTC7 Composite This signal consists of: a 100 IRE bar; a 2T sine-squared pulse; a 12.5T modulated sine-squared pulse; and, a 90 IRE, five-step staircase modulated with a +/- 20 IRE subcarrier. The bar is used to measure line-time tilt. The 2T sine-squared pulse is used to measure high-frequency response and group delay. The modulated 12.5T pulse is used to measure chrominance-to-luminance gain and delay. The staircase is used to measure non-linear distortion, such as differential gain and phase. Refer to your vectorscope and WFM manuals for test procedures.

Video Terms:

Blanking Level The 0 volt reference line on the video waveform. It is also 0 IRE.

IRE units The amplitude of the NTSC waveform is 1.0Vp-p and is divided into 140 IRE units. The upper portion with picture information spans 100 IRE units (or 714mV) from blanking level at 0Vdc to reference white

level, and the sync pulse spans 40 IRE units (or 286mV) down from blanking level.

Hue Also called Phase or Tint. The attribute of color perception that determines whether the color is red, blue, green, etc. The phase angle displayed by a vectorscope indicates a specific hue.

Chrominance A measurement of hue and its amplitude. On a vectorscope the chrominance amplitude is represented by the length of the vector.

Luminance Brightness as perceived by the eye.

Saturation Also called Chroma or Color. The degree to which a color (or hue) is diluted by white light in order to distinguish between vivid and weak shades of the same hue. It is a product of both luminance and chrominance amplitudes.

Differential Gain (dG) A change in color subcarrier amplitude due to a change in the luminance signal.

Differential Phase A phase change of the chrominance signal caused by a change in the luminance signal.

Product Support

For technical assistance please call NewTek's video technicians during regular business hours. Phone (913) 228-8282.

Warranty

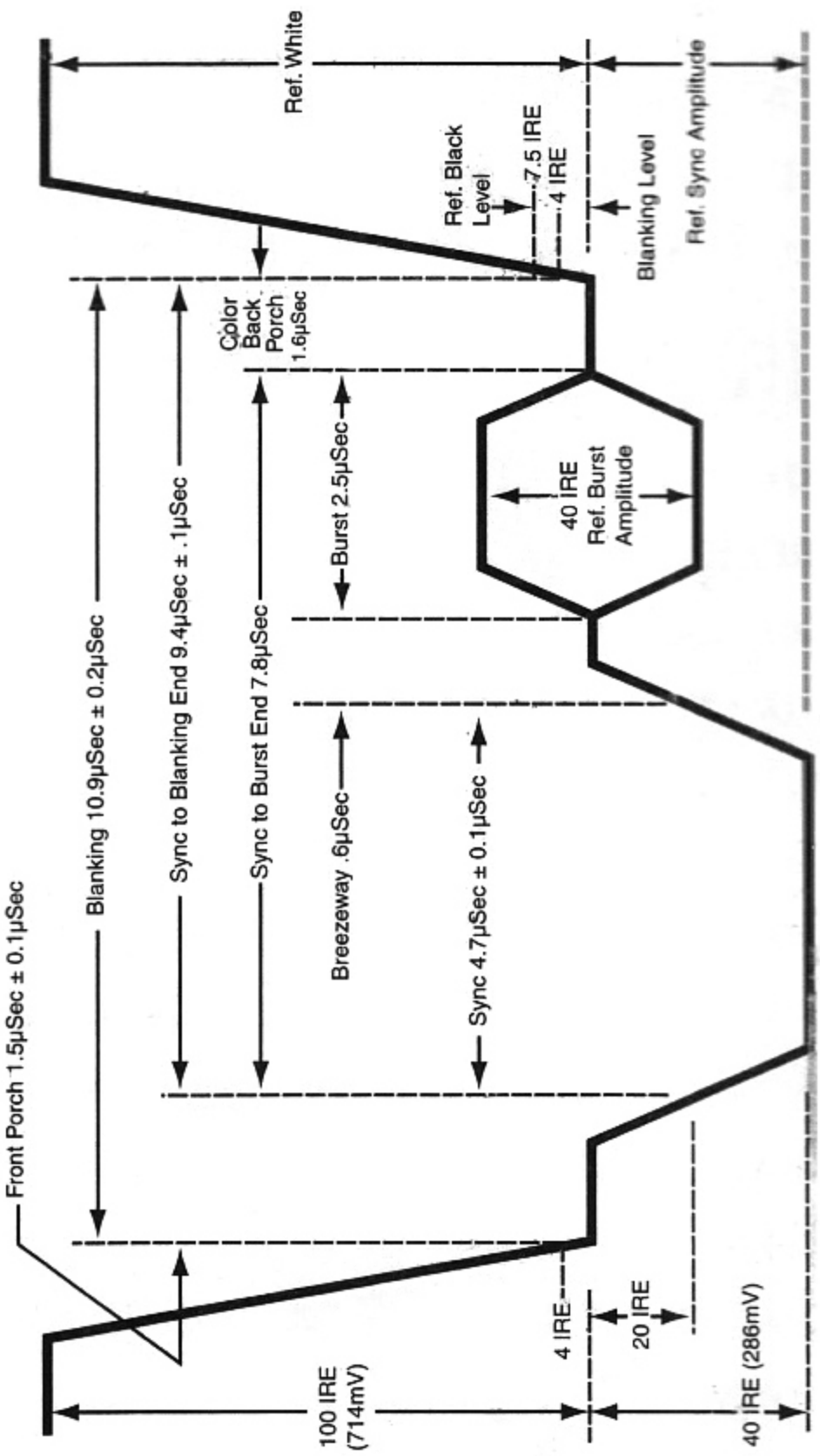
The CALIBAR video instrument is warranted against defect or unit failure for a period of 90 days from purchase.

CALIBAR Specifications

System: NTSC EIA RS-170A
Subcarrier frequency: 3.579545 MHz, trimmer adjustable
Output impedance: 75 Ohms
Output amplitude: 1 V into 75 Ohms, trimmer adjustable
Luminance amplitude accuracy: ± 2 IRE
Chrominance-to-luminance gain: ± 3%
SCH Phase: 0 degrees ± 5 degrees
Frequency response: Flat within 3% to 4.2 MHz, trimmer adjustable
Power: DC input, 3.45 mm (0.136 inch) connector
Range: 4 - 7 Volt
Polarity: Positive center
Video connector: BNC female
Typical continuous battery life: 2 hours with Lithium 6V cell; 1 hour with Alkaline
Physical dimensions: Length: 5.7 in. (145 mm); Weight without batteries: 2.3 oz. (65g)
Accessories: AC-1, AC adapter; ADK1, BNC adapter kit (most-used coaxial video adapters); NTPP, NewTek vinyl pocket protector

Model number: CN1

Specifications subject to change without notice.



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